Operational Art for the Objective Force

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AS THE U.S. Army's Transformation to an Objective Force begins, a host of questions have emerged. What might the Army of the future be called on to do, where, against what opponents, and under what conditions? How will the Army operate in the future joint, multinational, and interagency context? What technological innovations will affect the future conduct of Army operations? How will the Army fight tactically? How will the Army conduct those campaigns and operations that are predominantly land in character; that is, what will be the operational art of the future?

During a series of U.S. Army Training and Doctrine Command (TRADOC) seminar war games and annual Army Transformation war games, observations began to emerge to suggest that warfare was not changing only at the tactical level; the conduct of the campaigns of the 21st century would be significantly different from those of the 20th century.

Operational Art's Development

Before considering the operational art of the future, it is necessary to understand the operational art of the present. During the late 1970s and early 1980s, the Army added the operational level of war and operational art to its doctrine, which became the AirLand Battle Doctrine of the 1986 version of Field Manual (FM) 100-5, *Operations*.[1] The logic and necessity of the argument for operational art was so compelling that the joint community incorporated virtually intact the Army's doctrine into Joint Publication (JP) 3-0, *Doctrine for Joint Operations*.[2] The operational design construct of 1986 grew out of a sustained, detailed TRADOC study of military theory, history, and practice. The combination of insights and conclusions drawn from those three areas of study resulted in the doctrine that enabled the successes of Operations Just Cause in 1989 and Operation Desert Storm in 1990.

Despite the concept of logical, in the place of physical, lines of operations in the 2001 version of FM 3-0, planners of the ongoing counterterrorism campaign face the same challenge as planners of peace-support operations in the Balkans. Today's doctrinal concepts for operational design hamstring planners' and commanders' abilities to design and conduct effective, coherent campaigns for operations across the spectrum of conflict in today's security environment.

Among the key theoreticians examined were Carl von Clausewitz, with his contribution of centers of gravity, fog, friction, and culmination; Henri Jomini, with his derivation of lines of operation and decisive points; and the Russians Triandifilov and Tuchachevsky, with their development of deep battle and the operational level of war. And, because it was the lens through which all activity was viewed at the time, the entire theoretical approach was grounded in Newtonian logic and linear determinism.[3]

The analysis of history that went into developing the operational-design construct for AirLand Battle was equally exhaustive. Study of Napoleon's campaigns reveals the concept of large-formation operations, and the development of all-arms corps that could fight and win a battle on their own, independent from the main army. Helmuth von Moltke's 1866 and 1870 campaigns demonstrated the importance of maneuver. Ulysses S. Grant's campaigns in the American Civil War provided insight into the dynamics of operations distributed in time and space but united in purpose. The German Army blitzkrieg and the Russian Army deep operations in World War II contributed further insight into arrangement of battles and military action in time, space, and purpose.

Soldiers in an M1 Abrams and an M113 experiment with AirLand Battle techniques prior to the deployment of all envisioned equipment during REFORGER 82.

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In the area of practical application, the experiences of the Arab-Israeli wars of 1967 and 1973 were coupled with Cold War preparations for the expected large-scale, high-intensity combat defending the Central Region of Europe against attack by the Soviet Union. Experiences such as repeated multicorps REFORGER exercises, deliberate war planning, and senior-leader war games provided a forum for understanding the challenges of operational maneuver of large formations.

The lessons of theory, history, and practice were molded into the first U.S. doctrinal understanding of the operational level of war and operational art. The close cooperation, both doctrinal and practical, between the United States and other NATO nations quickly resulted in NATO-wide acceptance of the revised Western approach to operational art. The design of the military operation to remove Manuel Noriega from power in Panama in December 1989 and the coalition campaign to liberate Kuwait from Iraqi occupation in 1990 were based on the elements of operational design that formed the centerpiece of AirLand Battle Doctrine.

But times change, and so does the world and its most violent form of human interaction—warfare. The dramatic series of events that began with the fall of the Berlin Wall and that have continued through the current campaign against terrorism resulted in the Army performing a wide range of military operations across the full spectrum of conflict. Peace-support operations in Bosnia, Kosovo, and the Sinai; humanitarian assistance in East Timor, Haiti, andv Rwanda; and domestic support for counterdrug and flood and hurricane disaster response are samples of the many missions the Army performs.

Unfortunately, the current operational-design construct is often incapable of providing planners and commanders the means of designing campaigns and major operations these full-spectrum operations require. Despite the concept of logical, in the place of physical, lines of operations in the 2001 version of FM 3-0, planners of the ongoing counterterrorism campaign face the same challenge as planners of peace-support operations in the Balkans. Today's doctrinal concepts for operational design hamstring planners' and commanders'

The science of chaos and the theory of complexity lead to accepting systems theory to replace Newtonian linear determinism as the primary means of explaining how the world, societies, and warfare work. Doing so has profound implications for theories of war because key theories such as those of Clausewitz and Jomini are based on Newtonian approaches. Perhaps more important, systems theory provides significant opportunities to assist in the design and conduct of campaigns and major operations not centered on high-intensity combat.

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Future Operating Environment

The changing dynamics of the security environment are even more ominous. The future operational environment will be far more challenging for the U.S. Armed Forces than that of today. Freed of the Cold War strategic environment, potential opponents will be more numerous, adaptive, creative, and willing to employ force to achieve strategic goals. Rather than facing opponents trained and equipped to fight along the lines of the old Soviet model, the Armed Forces will face opponents who will combine conventional, unconventional, and information operations in a variety of new and effective ways. Those opponents will take advantage of the global proliferation of cheap, high-technology weapons systems to modernize selected portions of their armed forces, while seeking to take advantage of low-technology asymmetrical approaches to offset the United States' high-end warfighting dominance.

The use of cell phones for tactical and operational control in Somalia and the Balkans; the shooting down by Serbia of an F-117 Stealth Fighter; the attack on the U.S. *Cole,* and the attacks of 11 September 2001 are indicative of the variety and effectiveness of potential threats the Army will face in future operations and campaigns. Yet, not everything will change for planners and commanders of future campaigns and major operations; operational art will remain and—

- Will be about translating strategic purpose into tactical action.
- Will always be joint, multinational, and interagency.
- Will be about campaigns and major operations.
- Will be about the sequencing of battles, engagements, and military activities.
- Will always be integrated with diplomatic, economic, and informational efforts.
- Will be about focusing power at decisive times and places.

Despite anticipated changes in the operational environment, the nature of war remains the same. Even with high technology and the promise of information operations, war remains a nasty, brutal business in which people are killed, and things are destroyed.

Clausewitz's construct of the physical and moral domains of war—domains dominated by danger, exertion, uncertainty, and chance—remains as valid today as it was in 1830. Furthermore, any future warfighting doctrine must retain Clausewitz's focus on commanders and their ability to maneuver forces to bring about battle. Still, how the Army thinks about warfare and military operations will continue to change.

James J. Schneider's construct of the crucible of war is a case in point.[4] During the 1980s, as the Army refined its understanding of operational art, Schneider offered a metaphor that would assist in understanding how the application of military force brought about the defeat of the enemy. His construct was that of a crucible in which military force (heat) was applied against a unit (lead). The transformation of the lead from solid to liquid to gas was a metaphor for the application of physical force resulting in the successive destruction of forces (physical), followed by disorganization of command and control (C2) (cybernetic), and finally disintegration of unit cohesion (morale). Schneider's construct focused more on the unit than on the commander and more on the application of physical force than maneuver. The primary means for applying force in Schneider's metaphor was physical destruction.

The Army continues to see different ways of achieving opponents' destruction, disorganization, and disintegration. Theories of warfare in the information age, such as that expressed in Alvin and Heidi Toffler's book, *War and Anti-War,* offer different opportunities than those of the Industrial Age.[5] Information-age sciences, such as the science of chaos and the theory of complexity, focus on the system and information as the keys to military success. Repeated examples of precise application of combat power over the last decade begin to confirm the validity of these new theories of warfare.

Since the emergence of the 1986 version of operational art, the Army has continued to study the theory, history, and practice of war. Analyses of these three areas, along with an understanding of

Soldier of Fortune

Over time, the Mujahideen became fairly proficient baiting and conducting ambushes of Soviet helicopters which were often struck from above. Understanding that all military organizations from armored divisions to guerrilla bands—are systems enables us to describe, predict, and counter their actions in ways that are not possible using Newtonian logic.

Systems are found at all echelons—strategic, operational, and tactical—and range from national electric power distribution grids to long-range reconnaissance-strike to tactical maneuver systems. Many systems are not internal to a single unit or echelon but span multiple echelons and military units either in part or in whole. Some systems are even civilian in composition; many combine civil and military components. Future operational commanders will have to determine which enemy systems must be disintegrated, which can be simply disorganized, which need only have specific capabilities destroyed, and which can be ignored.

the future operating environment and the difficulties of designing campaigns over the last decade, suggests a need for a new construct of operational design. That is, the current elements of operational design might no longer be sufficient to enable the effective planning and execution of campaigns and major operations across the full spectrum of operations.

The science of chaos and the theory of complexity lead to accepting systems theory to replace Newtonian linear determinism as the primary means of explaining how the world, societies, and warfare work. Doing so has profound implications for theories of war because key theories such as those of Clausewitz and Jomini are based on Newtonian approaches. Perhaps more important, systems theory provides significant opportunities to assist in the design and conduct of campaigns and major operations not centered on high-intensity combat, such as peace-support operations, counterterrorism, or unconventional warfare.

Another set of emerging theories is those of the information age, such as found in the Tofflers' treatise. The Tofflers suggest that waves in which all human society changes drive true revolutions. They posit that the Third Wave—the information age—is upon us.[6] Over the past decade, such theories of information operations have grown exponentially, but incoherently. While theories of information operations promise significant changes in the conduct of war, unlike Joimini, it is difficult to translate information theories into practical operational concepts.

A detailed review of historical campaigns and major operations was critical to the early development of operational art. Historical study focused on campaigns that led to an operational design for large-scale, high-intensity combat against former Warsaw Pact forces. The nature of more recent U.S. military operations and the anticipated future operating environment leads historical study in a different direction. While large-scale, conventional campaigns

such as Operation Desert Storm must be studied, historical studies must branch out to encompass the full spectrum of military operations, including expeditionary campaigns and crisis-action operations. Relevant campaigns include, but are not limited to, Vietnam (1945-1975), Somalia (1992-1993), Falkland Islands (1982), Norway (1940), China-Burma-India (1941-1945), Panama (1989), and Kosovo (1999).

The new sciences, which simply did not exist 20 years ago, are forcing the Army to realize that all military organizations, in fact all organizations in the world, are systems and that their behavior as they interact with each other can be described and affected using systems theory. A radical departure from traditional thinking is to understand that an armored division is a system in the same manner that a terrorist group is a system.

To gain insight from current military operations, further study is required in the areas of homeland security (post-11 September 2001), counterdrug operations, counterterrorism operations worldwide, and ongoing operations in Afghanistan and the Philippines. Review of the planning and execution of these campaigns and major operations reveals the difficulty of trying to apply current operational-design doctrine. Centers of gravity, lines of operations, and decisive points are difficult to discern in a complex mix of political, economic, and military peacekeeping efforts in the Balkans or when attacking a worldwide, web-like, self-organizing, transnational terrorist organization such as al-Qaeda.

Five Operational Design Alternatives

A new operational-design construct is needed for the effective planning and execution of future campaigns and major operations. The important question is, what form should that design take? At least five alternatives are currently being examined as operational-design approaches. The five alternatives have grown out of attempts to grapple with the difficulties in applying current doctrine. They include the following:

1. Current doctrine. The current design of centers of gravity, lines of operations (both physical and logical), and decisive points might be sufficient if refined based on current practice.

2. Systems. The systems approach views all military organizations as complex systems and would apply emerging systems and the science of chaos and the theory of complexity to developing an operational-design construct with which to execute the military equivalent of forcing opposing systems into either chaos or equilibrium.

3. Effects-based. Developed initially from U.S. Air Force (USAF) Colonel John Warden's work, *The Air Campaign*, the effects-based approach describes what effects are required to secure strategic objectives and then conduct military actions that would bring about the required effects.[7] The USAF champions the effects-based approach and has developed it as a concept nested in a broader "Rapid Decisive Operations" concept by Joint Forces Command.

4. Destroy-dislocate-disintegrate. This approach, largely theoretical, seeks as rapidly as possible to conduct military operations and apply combat power to successively (ideally simultaneously) destroy, dislocate, and disintegrate opposing military forces. During the 1990s, TRADOC gained an appreciation for this approach during its series of mobile strike force experiments.

5. Center of gravity (COG) to critical vulnerabilities. The U.S. Marine Corps is examining an innovative doctrinal approach that seeks to translate the theoretical construct of the center of gravity into a practical approach to applying combat power. This approach is to find the critical vulnerabilities of an opposing force—those that will cause its center of gravity to fail—then attack and defeat critical vulnerabilities.

Because development of the current operational art and Schneider's destroy-dislocate-disintegrate model have already been discussed, the next three paragraphs discuss only the remaining approaches to changes in operational art: the systems approach, effects-based operations, and critical vulnerabilities. From an understanding of all five approaches, it might be possible to determine the direction further exploration should take.

The systems approach. There is no doubt that the systems approach must be integrated into any new operational-design construct. The new sciences, which simply did not exist 20 years ago, are forcing the Army to realize that all military organizations, in fact all organizations in the world, are systems and that their behavior as they interact with each other can be described and affected using systems theory. A radical departure from traditional thinking is to understand that an armored division is a system in the same manner that a terrorist group is a system—as are carrier battle groups, fighter squadrons, and maintenance detachments.

Understanding military organizations and opponents as systems enables us to describe, predict, and counter their actions in ways that are not possible using Newtonian logic. For example, in a Battle Command Training Program warfighter exercise, we can model fairly well, using Lanchester Equations

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These soldiers of the 99th Infantry Division reached their state of "equilibrium" when they had no alternative to enemy action and surrendered during the Battle of the Bulge, December 1945.

Systems theory shows that most systems exist in a state of complex interaction with their environment and other systems. Systems that are unable to cope with or adapt to changes in their environment or that are the result of interactions with other systems are forced out of complexity and into one of two other states. Those two states are equilibrium and chaos. Equilibrium is a state in which the system is incapable of any productive activity. Chaos is a state in which there is a great deal of activity but no purpose or direction.

based on linear mathematics, the movement and combat of units and formations.[8] We can evaluate the results of combat between two opposing forces, but we could never model the effect of reduced C2 capabilities or morale. However, application of systems and complexity theories enables entity-based modeling that, in turn, can demonstrate the impact of the loss of communications or the moral impact of a successful turning movement.

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An army unit is in a state of complexity if it is conducting an operation successfully, has positive command and control, and is adapting to changes in the environment or enemy action. If the same army unit was placed in a situation in which it had no alternative to enemy action and its soldiers had surrendered, that unit would be in equilibrium. Take the same unit, destroy its cohesiveness and command and control so activities are uncoordinated, and some elements will break ranks and retreat. The unit would be in chaos.

Some examples of systems in equilibrium are the French Strategic Command during the German Blitzkrieg of 1940; the Iraqi Air Defense System after the initial strikes of Operation Desert Storm; and the Soviet Union in 1989 when the Warsaw Pact disintegrated. Some examples of chaos are the French tactical forces opposing the German Blitzkrieg of 1940; the Iraqi Army during the Desert Storm ground operation; and the United States during the later stages of the Vietnam war (1967-1971).

Applying systems theory to military operations is simple in some respects, difficult in others. Military organizations have always been systems, we just did not know it for the first 5,000 years or so. On the other hand, understanding and applying the science

of chaos and theory of complexity requires education in new terms and patterns of thinking. For example, system theory states there are seven attributes to any system. These seven attributes are powerful tools to describe a system and actions that can defeat that system, but those attributes must be learned, understood, and applied. Below are the attributes commonly used to describe a system and to understand how it functions:

All future campaigns will be combinations of conventional, unconventional, and information operations. Opponents will employ these three types of conflict in different combinations for each scenario. The United States and its allies must be prepared to counter and defeat all three. This is a fundamental change from the U.S. military establishment's focus on conventional warfare to the exclusion (except in Special Forces) of unconventional and information warfare.

Aggregation is the attribute of a system that enables adaptation when encountering more complex problems by combining (aggregating) smaller agents or subsystems into larger subsystems to perform critical tasks. A military example of aggregation is organization into successively larger formations or echelons (battalion–brigade–division–corps or squadron–group–wing–air expeditionary force).

Building blocks are the components of the system that are aggregated to provide new capabilities and can be existing agents, meta-agents, subsystems, or new components the system creates to adapt to new challenges. The military equivalents are units or weapons systems.

Tagging is the means by which the system identifies its component parts as it functions or adapts. Military examples are unit guidons, designations (11th Cavalry), or e-mail addresses.

Flows are the movement of agents, resources, or information through the system. Military examples are the movement of units through the air or over land or sea; the distribution of ammunition or fuel throughout a unit; or the passing of orders through the C2 system.

Tnternal models are coping mechanisms that a system has employed or will employ to successfully adapt to or overcome challenges to its functioning and existence. A military example might be battle drills or evasive maneuvers to avoid antiaircraft missiles.

Diversity is the attribute of a system wherein it uses a variety of agents, models, and building blocks to create multiple ways of adapting and surviving. A military example is the use of a variety of combined arms in battle.

Nonlinearity is the means by which systems avoid predictable and deterministic behavior in order to have the versatility and adaptability required to remain viable and productive in complex situations. The military example in this case is innovation, out-of-the-box thinking, and asymmetrical operations.

The practical application of systems relates to the variety of systems potential that opponents might employ. Such systems are found at all echelons—strategic, operational, and tactical—and range from national electric power distribution grids to long-range reconnaissance-strike to tactical maneuver systems. Many systems are not internal to a single unit or echelon but span multiple echelons and military units either in part or in whole. Some systems are even civilian in composition; many combine civil and military components. Future operational commanders will have to determine which enemy systems must be disintegrated, which can be simply disorganized, which need only have specific capabilities destroyed, and which can be ignored.

Effects-based operations. The effects-based approach to operations that grew out of Warden's book has considerable merit from the standpoint that it focuses on what effects are desired rather than simply applying force aimed at destruction.[9] In Warden's model, airpower should always be applied to gain strategic objectives. The primary target of airpower has been the opposing strategic leadership, with supporting targets of organic essentials, infrastructure, population, and the Armed Forces. Joint Forces Command is examining the USAF effects-based operations (EBO) cycle as a concept within the broader rapid decisive operations concept.

The EBO cycle provides a strong strategy-to-task linkage, but it provides no methodology for the integration of the desired effects into a broader campaign or major operation. Instead, the EBO cycle is optimized for deciding if and how to "take down the enemy power grid," but it provides no framework for deciding if the Army should. Given that strategic attack has almost never brought about the desired end state, the EBO cycle can be used in execution of a campaign, but it contributes little to the design of that campaign. Yet, effects-based thinking is absolutely critical to a systems approach to campaign design.

Critical vulnerabilities. Joe Strange, of the U.S. Marine Corps University, proposes a practical approach to operational thinking that seeks to take the theoretical construct of Clausewitz's center of gravity and derive from that construct military tasks that

can accomplish strategic objectives.[10] Strange's approach is to identify the enemy COG, then identify the critical capabilities (CC) of which it is made. Having identified the critical capabilities, Strange derives the critical requirements (CR) that the CC must have to accomplish the enemy's purpose. From the CR he derives the requirements that have specific vulnerabilities that can be attacked and defeated. The concept is that attacking and defeating critical vulnerabilities removes CR, without which the CC cannot enable the enemy COG. The importance of Strange's concept is that he provides a systematic method for translating the often-nebulous concept of the COG into meaningful military tasks. Yet, in a way, this is a high-value/high-payoff target approach to operational planning. As such, it treats the opposing force as a house of cards, with hope that removing a few key cards will cause the entire enemy structure to fall. From a historical viewpoint, this has almost never been the case, and one of the prime reasons for developing operational art was that, by the 20th century, armies (as well as navies and air forces) had grown so large and resilient that no single blow could defeat them.

Bringing It All Together

As U.S. Armed Forces carry out the global war on terrorism, while also looking toward future security requirements, some key insights are apparent. All future campaigns will be combinations of conventional, unconventional, and information operations. Opponents will employ these three types of conflict in different combinations for each scenario. The United States and its allies must be prepared to counter and defeat all three. This is a fundamental change from the U.S. military establishment's focus on conventional warfare to the exclusion (except in Special Forces) of unconventional and information warfare.

The current conventional campaign-planning construct must be retained, which means there will still be campaigns against state opponents with primarily conventional military forces. Defeat of those forces will require the military to design portions of future campaigns around centers of gravity, decisive points, and lines of operations leading to conventional battles and engagements.

The destruction, disorganization, and disintegration of selected enemy strategic, operational, and tactical systems will enable rapid, decisive defeat of enemy forces. The military has used precision-strike to negate enemy strategic systems, such as electric power grids. In future campaigns, land forces will have to lead efforts to defeat opposing operational systems, such as reconnaissance-strike and distribution of petroleum oils and lubricants. Land forces will use combinations of fires, electronic warfare, information operations, and special forces, supported by air, space, and naval capabilities. Successful campaigns will require a moral component to gain support of neutrals, reinforce the support of friendlies, and break the morale of opponents.

These insights suggest a broad outline of a new construct of operational design for the Armed Forces in the 21st century. This construct is one that has significant implications for the design of the Army's Objective Force. Future Army forces must be designed with the qualities of campaign durability required to fight combinations of battles and engagements over increased space and time. At the same time, Army forces must have new capabilities that enable identification and understanding of opponents' systems and possess the requisite attack capabilities to defeat those systems.

Future Army forces must be truly full spectrum. That means leaving behind the almost total focus on physical force and developing balanced capabilities to attack the physical, mental, and moral aspects of opponents while retaining the core ability to take, hold, and control the ground. Such a transformation of U.S. Armed Forces must be accomplished in the full meaning of design—doctrine, training, leader development, organizations, materiel, and soldiers—to enable operational commanders to plan, prepare, and execute campaigns and major operations incorporating the elements of operational design. ***MR***

NOTES

1. Field Manual (FM) 100-1, *Operations* (Washington, DC: Government Printing Office (GPO), 1986).
2. Joint Publication 3-0, *Doctrine for Joint Operations* (Washington, DC: GPO, 14 June 2001).
3. For a discussion of Newtonian approaches, *see* <www.newdream.org/conversation-arc/msg01811.html>.
4. James J. Schneider, "A New Form of Warfare," *Military Review* (January-February 2000), 57-58.
5. Alvin Toffler and Heidi Toffler, *War and Anti-War* (NY: Time Warner Books, 1995).
6. Alvin Toffler, *The Third Wave* (NY: Bantam Books, 1991).
7. John A. Warden III, *The Air Campaign* (toExcel, Incorporated, 1 October 1998).
8. For a discussion of Lanchester Equations, *see* <archives.his.com/intelforum/msg01873.html>.
9. Warden.
10. Joseph Strange, *Centers of Gravity and Critical Vulnerabilities: Building on the Clausewitzian Foundation So That We Can All Speak the Same Language* (Quantico, VA: U.S. Marine Corps University, 1996).

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